

**Idaho Department of Fish and Game,
April – June, 2004**

Kootenai River Fisheries Recovery Investigations

Quarterly Progress Report and Summary of Activities

Project Personnel:

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Field Work Completed or in Progress and Summary of Results

Rainbow and Bull Trout

The final draft of the 2002 Annual Report is in Boise for signatures and should be uploaded to BPA sometime in July. Work continued on a manuscript summarizing sources of rainbow trout recruitment to the Kootenai River, Idaho based on research conducted from 1997-2002. We expect to submit this article to Northwest Science in July. The monthly water nutrient samples were collected from Boulder Creek in June and sent to a lab for analysis. Analysis of

data from the 2003 Callahan Creek screw trap sampling was also initiated. The juvenile (age-1 and older) rainbow trout out-migrant estimate from Callahan Creek was 1,132 (95% C. I. = 699-1,787), while the bull trout out-migrant estimate was 68 (36-508). The out-migrants could not be separated into age-classes based on size, but the mode was 150 mm for both species (Figures 1 and 2).

Ecosystem Rehabilitation

This quarter, 250 ml of ammonium polyphosphate ($\text{NH}_3\text{P}_2\text{O}_5\cdot 6\text{H}_2\text{O}$) samples were sent to ALS Environmental in British Columbia for metals analysis. This will help us determine the weight by volume that will be added to the river in the nutrient enhancement efforts. To determine the metals contribution we will utilize the following simple equations: Background concentration X flow = total weight of each metal in the river. Fertilizer metal concentration X volume added = total weight added. Finally,

we will compare this to EPA guidelines for aquatic life and drinking water to see if the resulting concentrations are a concern.

Last quarter, the decision was made to tag mountain whitefish to deal with the question that we may be sampling a transient population that is moving through to spawning locations higher up in the drainage and not the resident population that will be experiencing the effects of nutrient enhancement. If this is the case our estimates may not be an accurate indication of the success of the treatment. We will fit 25 mountain whitefish (the week of July 26th)

with radio tags (Figure 3) and follow them through their spawning season (Late September-mid November) to determine what proportion are leaving our biomonitoring areas (Figure 4) during our fall sampling.

This quarter, zooplankton sampling was performed each month and is in the process of being analyzed. Additionally, IDFG is assisting the KTOI in collecting nutrient samples as well as chlorophyll concentrations in the upper canyon section in order to

facilitate collection efficiency.

On July 21-23, 2004 the International Kootenai River Ecosystem Rehabilitation Team (IKERT) will meet to make final preparations for moving forward with nutrient enhancement efforts on the Kootenai River. Josh Korman and Carl Walters (well-known ecosystem modelers) will be running through scenarios and possible outcomes (positive and negative) with regards to fertilizing the Idaho section of the Kootenai River.

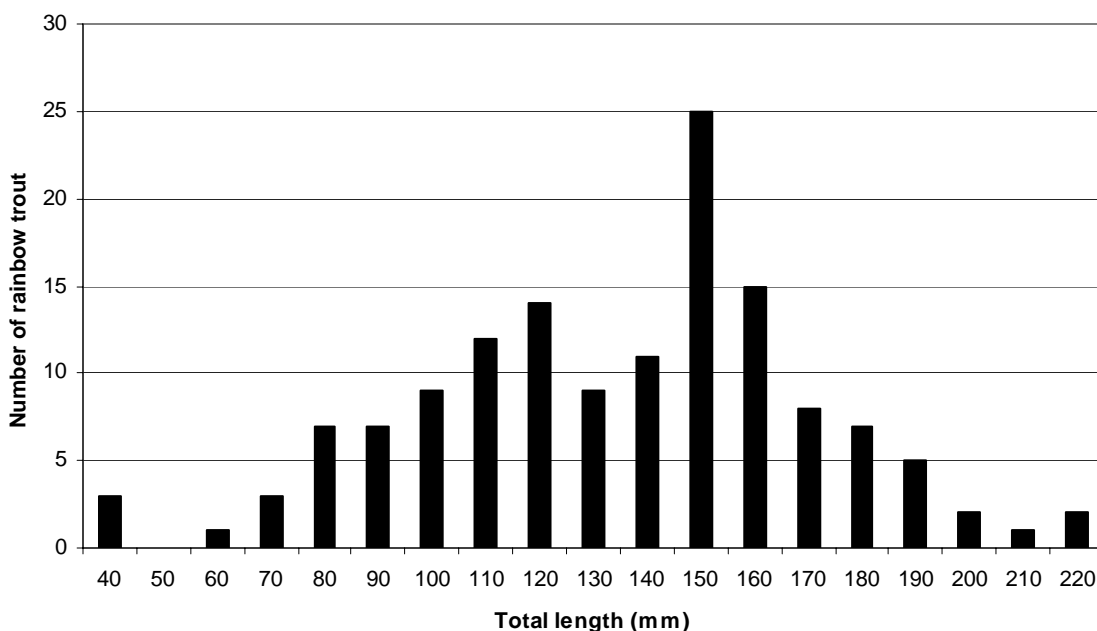


Figure 1. Length frequency distribution of rainbow trout out-migrants caught with a screw trap in Callahan Creek, April-July, 2003 (includes three young-of-the-year).

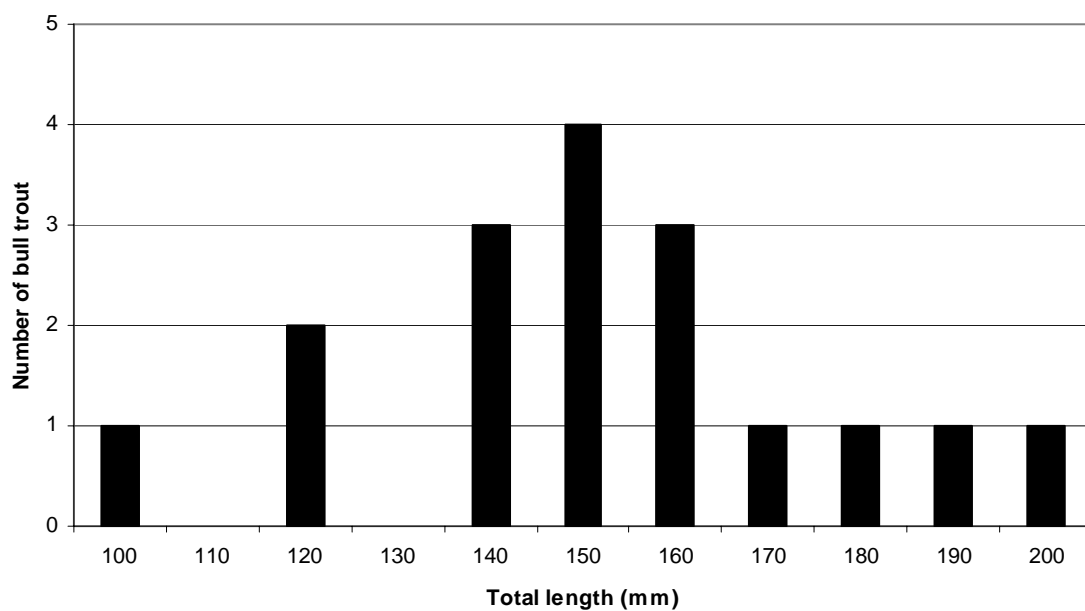


Figure 2. Length frequency distribution of bull trout out-migrants caught with a screw trap in Callahan Creek, April-July, 2003.

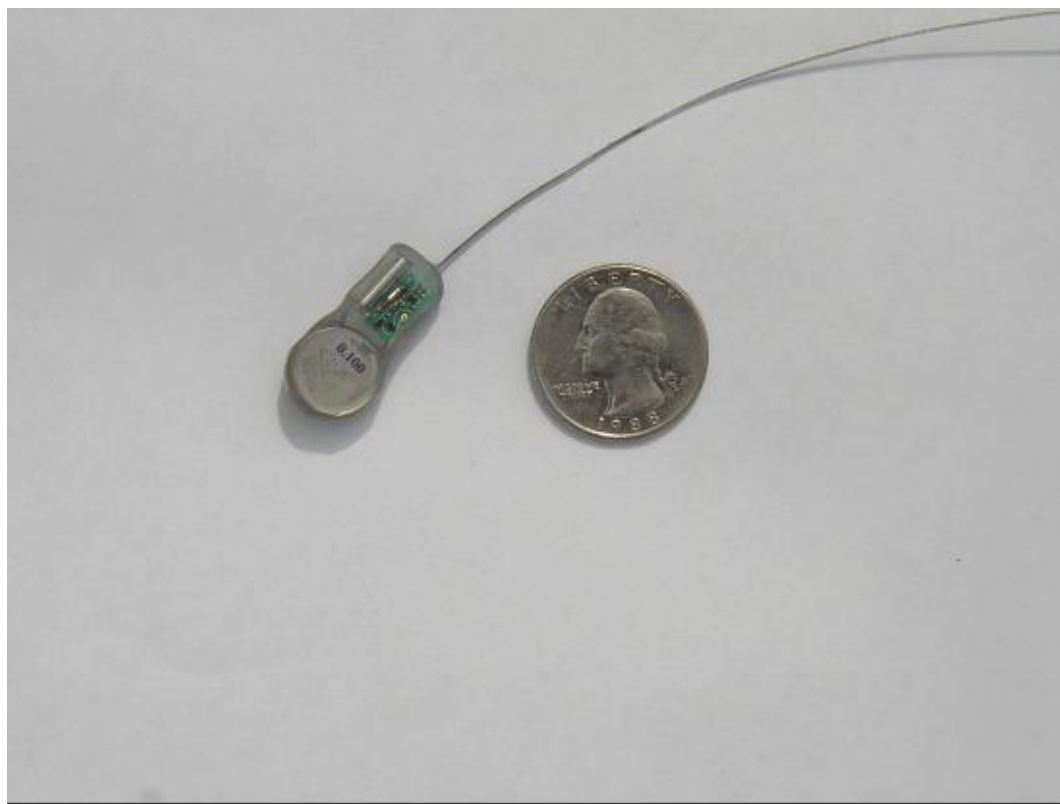


Figure 3. Example of the radio tags that will be used to track mountain whitefish this fall.



Figure 4. Kootenai River upstream from Bonners Ferry, Idaho (Crossport; RKM 256).

Burbot

Sampling for adult and larval burbot was discontinued the previous quarter. All temperature recorders were retrieved from tributary streams. The only field activity is

telemetry, however, we have found no active transmitters in the past three months.

White sturgeon

Kootenai River white sturgeon recovery field activities during the spring period included adult sampling with setlines and with angling, ultrasonic and radio telemetry, egg mat sampling, and larval sampling with drift nets and light traps. Adult sturgeon sampling began in March and continued into June.

One hundred fifty-two adult white sturgeon were collected with setlines and angling. Twenty-nine of the white sturgeon

sampled were females, 80 were males, and 41 were of unknown sex. Surgical procedures were performed on a sub-sample of the adults to determine sex and stage of maturity. Twenty-eight of the 150 adults sampled were new fish, and not previously captured. Total length ranged from 110 to 337 cm and weight ranged from 6 to 88 kg.

Seventeen (6 females and 11 males) of the adult sturgeon captured in 2004 were fitted with ultrasonic and radio transmitters.

All seventeen of the adults tagged were moved to the Hemlock Bar reach as part of the Set and Jet Program. The goal of this program is to unite spawning male and female white sturgeon with "proper" spawning substrates (Figure 5), and hopefully increase larval recruitment and young of year production. Preliminary results from 2004 data suggest that males moved early in the spawning period tend to stay in the Hemlock Reach longer, and the best chance for successful spawning occurs when males are moved early, and ripe females are moved later in the spawning period.

The initial focus of egg mat sampling

in 2004 was to determine the dates and conditions of the first spawning events. Egg mats were initially deployed in the primary (post-Libby dam) spawning reach near Shorty's Island (rkm 229.0). Twenty egg mats were deployed on May 3 and three eggs were found on May 5. Egg mat sampling focus then shifted to documenting spawning in the Hemlock Bar reach (rkm 261.8) from the Set and Jet Program. Egg mat sampling continued into June, but no white sturgeon eggs were collected in the Hemlock Bar area.



Figure 5. Spawning substrates at the Set and Jet release sites near rkm 262.5, Kootenai River, Idaho, 2004.



Figure 6. Light trap used for larval fish sampling on the Kootenai River, Idaho, 2004 (note the cylume light stick inside the trap).

Sampling for pre-juvenile white sturgeon began June 14 and will continue into July. Sampling was conducted at Ambush Rock (rkm 244.5), Shorty's Island (rkm 230.5), and Flemming Creek (rkm 225.0). Eighty percent of the sampling was conducted at night because other studies suggest that this is the time when pre-juvenile sturgeon are most susceptible to drift. The focus of the 2004 larval sampling was documenting any larval recruitment from the Set and Jet Program, or within the traditional post-Libby dam spawning reach. In addition to standard larval sampling with d-ring and half-meter drift nets, light traps (Figure 6) were designed and used as an additional method of documenting larval recruitment. To date, approximately 50 larval fish have been captured in several weeks of intense d-ring

and half-meter net sampling, and several hundred larval fish have been captured in 3 nights of light trapping. Most of the larval fish sampled appear to be mountain whitefish, suckers, and sculpins. A more structured study design and sampling protocol for light trap sampling will be developed during the next period.

In addition to standard ultrasonic and radio telemetry sampling, an array of 17 VEMCO sonic receivers (Figure 7) has been deployed from the Canadian border at Port hill, Idaho (rkm 170) to Ambush Rock (rkm 244.5). With this technology, fish implanted with VEMCO transmitters that pass through the array will leave a digital mark on the receivers. Receivers can be downloaded as infrequently as once per year, at our convenience. This may prove to be a much

more efficient method of tracking fish movements. We anticipate tagging several juvenile and adult white sturgeon with VEMCO transmitters during gillnetting activities scheduled for the next quarter.

These same VEMCO receivers can be used in coordination with VEMCO transmitters this winter for burbot, thereby increasing their utility.



Figure 7. VEMCO sonic receivers used for Ultrasonic telemetry, Kootenai River, Idaho, 2004.

Activities Planned for Next Quarter

Burbot

- Telemetry for burbot will continue at a minimum of once a month in coordination with sturgeon telemetry
- Vaughn will continue to work on the winter 2003-2004 annual report
- Coordination will continue for a burbot and temperature affects on reproductive fitness study to be held at the Hammond Bay, Michigan USGS lab winter of 2004-2005

White Sturgeon

- Gill net for juvenile white sturgeon
- Radio and sonic telemetry.
- Pre-juvenile and larval sampling

Ecosystem Restoration

- Tag 25 mountain whitefish and track through their spawning migrations
- Perform population estimate for mountain whitefish, rainbow trout, and largescale suckers at the 3 km Hemlock Bar reach in the upper canyon reach of the Kootenai River.
- Electroshock 5 biomonitoring sites to continue our evaluation of catch and biomass per unit of effort.
- Zooplankton and rotifer sampling and identification will continue.
- Finish draft 2003/04 annual report.

Rainbow and Bull Trout

- Continue analysis of 2003 data
- Submit the rainbow trout recruitment manuscript to [Northwest Science](#)
- Begin writing the 2003 annual report
- Collect monthly nutrient samples from Boulder Creek in July, August, and September

Meetings Held/Attended and Communication

Jody participated in the bull trout status assessment workshop held in Coeur d'Alene in June. Jody met with representatives of the Burlington Northern Santa Fe railroad to inspect perched culverts on two Kootenai River tributaries and discuss possible improvements for fish passage

Ryan and Vaughn collected zooplankton from five lakes with self-sustained burbot fisheries. Vaughn wrote a burbot news release and had one news interview and one radio interview.

Vaughn attended one Kootenai River burbot recovery team meetings

Vaughn had a telephone coordination meeting with William Swink USGS Hammond Bay Michigan pertaining to a burbot temperature and reproductive fitness lab study in association with Molly Webb of Oregon State University

Vaughn had a coordination meeting with Matt Powell of U of I, Paul Anders S.P. Cramer and Assoc. and Jim Dunnigan MFWP and others to coordinate a region wide burbot genetics investigation

Pete attended and gave program updates at Kootenai River Recovery Team meetings.

Pete participated in four Kootenai River Recovery Team conference calls.

Pete installed wireless broadband at the Idaho Fish and Game Bonners Ferry Field Station, which enabled high-speed Internet access for multiple computer users.

Pete completed one news release regarding Kootenai River sturgeon activities.

Vaughn attended a pallid sturgeon recovery workshop

Vaughn attended a USACE season water forecasting public meeting

Vaughn, Ray Beamesderfer and Sue Ireland completed a second revision (hopefully the last) of a KR white sturgeon demographics ms. for the Transactions of the American Fisheries Society (TAFS)

Vaughn and Jeremy Duher had a depth sensitive transmitter/white sturgeon ms. accepted by the TAFS

Vaughn, Ryan, and Brian Gunderman submitted a second revision of a burbot migration rate and flow ms. to the Journal of Fish Biology

Vaughn and Diane submitted a ms. on transmitter shedding and white sturgeon to Northwest Science

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Sue Ireland (KTOI)
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Jeff Laufle & Greg Hoffman (USACE)
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Virgil Moore, Steve Yundt, Ned Horner, Chip Corsi, Greg Johnson, Fred Partridge, Mark Gamblin (IDFG)
Gary Barton (USGS)
Boundary County Commissioners